

### Abstract of the Disclosure

A pump especially designed for pumping blood comprises a bladder, the interior surface area and volume of which is changeable, i.e., it stretches and expands during the filling phase, and elastically contracts to its normal relaxed size during the ejection phase. The bladder has a fluid inlet and a fluid outlet. A device, such as a vacuum pump, alternately expands and contracts the interior surface area and volume of the bladder. Most of the interior surface area of the bladder expands and contracts in each cycle. One or more check valves or other means for causing substantially one-way fluid flow through the bladder are also provided. The pump of the invention decreases the likelihood of blood clots forming in the pump, decreases the risk of damage to blood cells, improves the pumping characteristics of the device, and decreases or eliminates the chance of foreign fluids passing into the blood stream should a tear or break occur in the bladder.